Summer 2018

Mathematics 2018 Los Alamos Self-Study & Documents

University of New Mexico - Los Alamos Campus

Academic Department and Program Review

2017-2018 Academic Year

The Academic Program Review process at UNM-Los Alamos has been developed to complement the on-going institutional effectiveness process and to become a vital part of institutional planning. The program review is a comprehensive, systematic method of evaluation and review of achievement conducted every 3 years within academic programs for the following purposes:

1. *To improve teaching and learning*
2. *To evaluate and analyze current practices*
3. *To promote faculty discussion about curriculum within a program*
4. *To ensure that program planning is related to goals at the institutional, programmatic, and course levels*
5. *To evaluate program support in the areas of technology, equipment, supplies, facilities and staffing*

The program review process at UNM-LA is comprehensive and cyclical and consists of the following components:

1. *The development of a written report by program faculty and Department Chair*
2. *Submission to Institutional Effectiveness Committee*
3. *Recommendation report from the IE committee to the department*
4. *Submission to Dean of Instruction for review*
5. *Recommendation from the Dean of instruction to the department*
6. *Response from the department about planned changes as a result of the process*

The following information will be considered during the review for each department and program.

- *Overview of the department including disciplines and programs*
- *Mission of the department*
- *Mission of each program being reviewed*
- *Goals for each program being reviewed*
- *Curriculum*
- *Continuous improvement (Assessment)*
- *Students*
- *Faculty*
- *Resources and planning*
- *Facilities*
- *Program comparisons and articulation with UNM or other entities if appropriate*
- *Summary and future direction*

I. Introduction, Background, and Mission

Provide a brief description of your department including disciplines and programs within the department by completing the areas below.

General Information

Date of submission

July 19, 2018

Name and Description of Department. Please include names of all degree programs within the department.

Mathematics, Engineering, and Science

History of Programs: Please provide information about each program being reviewed, including known history, date started, etc.

There are no degree programs in the Mathematics area. We will consider that the mathematics courses form a program and we will refer to this program as the mathematics program.

Please describe any advisory committees for programs being reviewed, and list names of members. Also indicate if there is no advisory committee and if one is planned.

none

Do you have outside accreditations or do you plan to pursue them? If not please indicate that you do not have external accreditations.

There is no outside accreditation for the program and we don't plan to pursue any such accreditation.

Provide a summary of the last Academic Program Review for the department and each program being reviewed this year. Include the date it was conducted, a summary of the findings, and a summary of the action plan made as a result of the recommendations, as well as any actions you have taken.

2016, math courses

Provide the mission and vision of both the department and each program being reviewed. How does this vision and mission support UNM-LA's mission and goals, as well as the mission and goals of UNM? How does the program benefit the students from the area? When the students complete the program, will they likely transfer or find a job? What types of jobs will they be prepared to find?

The mission of the mathematics program is to provide quality courses for our students and recruit, retain, and support qualified faculty. The goals of the program are to:

1. Prepare students for transfer
2. Staff the department sufficiently to maintain high standards
3. Retain students to the end of our courses

The goals meet the "Preparation for Transfer" and "Pathways for Career" of the Mission and Goal #3, staffing, and Goal #4, Increase enrollment.

II. Program Goals

Complete for each Academic Degree program and certificate:

Program 1.

Full Official Name of Academic Program.

Mathematics program

List the learning goal(s) (measurable) for the Academic Program:

1. Prepare students for transfer
2. Staff the department sufficiently to maintain high standards
3. Retain students to the end of our courses

Explain the manner in which learning goals are communicated to students and provide specific examples.

Learning goals are communicated to students in the syllabus.

Provide examples of how satisfaction of the program goals serves constituents.

With a strong mathematics background, students will be better prepared for upper level coursework upon transfer.
Well-qualified and dedicated faculty will provide academic support to students so they achieve their educational goals.

Provide examples of outreach and/or community activities offered by the program including any conferences, speakers, community service, and community participation at events. Provide an assessment of these outside activities.

none

III. Teaching and Learning: Curriculum

Curriculum

In the first box, list all catalog courses which are service courses in the department. This would include courses taught by the department which are general education courses or other courses for general use, and not necessarily for a specific degree in the department. For areas such as Math and Communications, this would include most of the courses. In the remaining boxes, list courses which are specific to departmental degrees. Do not include courses taught by a different department. Indicate how many sections were successfully offered during each of the last six semesters (3 years); include courses that have not been taught at all. Please mark all general education core classes.

Department Service Courses: Mathematics Program (all courses)

Course Number	2017-2018		2016-2017		2015-2016		2014-2015	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
MATH 011	2	1	2	1	2	1		2
MATH 012	4	2	4	2	4	2		4
MATH 021	2	1	2	1	2	1		2
MATH 022	4	2	4	2	4	2		4
MATH 101	2	3	2	2	2	3		2
MATH 102	2	3	2	2	3	3		2
MATH 103	4	6	4	4	5	6		4
MATH 107	2	2	2	3	2	2		3
MATH 120	0	0	0	0	0	0		2
MATH 121	3	3	4	4	4	3		4
MATH 123	1	1	1	1	1	1		1
MATH 150	1	2	2	2	2	2		2
MATH 153	1	0	0	0	0	0		0
MATH 162	1	1	1	1	1	1		1
MATH 163	1	1	1	1	1	1		1
MATH 180	1	1	1	1	1	1		1
MATH 181	0	0	0	1	0	1		0
MATH 192	0	0	1	1	1	1		1
MATH 264	1	1	1	1	1	1		1
STAT 145	2	3	2	2	3	4		3

Please describe the general education requirement for this program.

Eighty percent of college-level courses offered in the program are part of the general education core curriculum in area 2. Although Trigonometry (Math 123) is a pre-requisite for several general education core courses, itself is not considered one. We teach Math 123 every semester.

Please describe the delivery mode for delivering classes in this program.

Face-to-face and online

IV. Teaching and Learning: Continuous Improvement

Has a Program Assessment Plan been created and submitted for each program in the department?

☒ YES ☐ NO ☐ NA

If "YES", please give date of submission for each and explain any changes you have made or expect to make to each plan. **(Please attach all plans to the end of this review document.)**

Spring 2018

If "NO", when do you expect to have each plan completed?

Has a Program Assessment Report been submitted for each program (currently being reviewed) in the department? (Please attach the most current Assessment Report to the end of this review.)

☒ YES ☐ NO ☐ NA

If "YES", give the date of submission for each. **(Please attach the latest report to the end of this review document.)**

Spring 2018

If "NO", when do you expect to have each report completed?

What are the student Learning Outcomes for each program being reviewed?

1. Students enrolled in Mathematics courses will demonstrate their ability to solve problems using mathematical problem solving techniques, and communicate effectively both written and orally.
2. Students will analyze, interpret, and apply data that they collect, or that is specified for student use.
3. Students will analyze specified conditions, formulate solution approaches and solve problems

How are the student Learning Outcomes for each program being reviewed communicated to faculty? To students?

Learning Outcomes are communicated to faculty through email messages and during department meetings.
Learning Outcomes are communicated to students through the course syllabus.

What are the direct and indirect methods for assessing the student Learning Outcomes for each program being reviewed?

Rubric based on final exam problems

Does the use of assessment processes result in continuous improvement in the program/unit?

☒ YES ☐ NO

If yes, describe any changes being planned as well as the recent improvements that have come about in response to needs identified through these evaluation processes:

Department is reviewing the number of assessments (assignments, quizzes, tests) that would have the most impact on student achievement. Written homework assignments have resulted in increased passing rates in basic algebra course.

If no, outline your plans for incorporating needed improvements (as identified by your assessment) into your program.

Overall, how is the department/program engaged in a cohesive process of continuous improvement? How do you monitor the effects of the changes made?

The department reviews the assessment reports to monitor if the changes have impacted student achievements.

V. Students

Please answer these questions about each program within your department. (Enrollment, Retention, Graduates and Licensing Exams)

Degree Program Name: math courses

Academic Year (At least Past Three Years)	Fall number of Majors	Spring number of majors	Number of Annual Graduates	Name of State or National Licensing/Certification Examinations, # of Students Taking Examinations, and and % of Students Passing Examinations for each academic year IF APPLICABLE		
				Name of Examination	Number of students taking exam	Number of students passing exam
2017-2018	425	337	NA			
2016-2017	430	385	NA			

Course Completion Rates

Please enter all courses taught by the department on excel spreadsheet**. See excel spreadsheet labeled "Course Completion Rates" to enter and interpret Data. Include spreadsheet as part of your Program Review package.**

Course	Number and % of Students with A, B, C				Number and % of Students with D, F				Number and % of Students with W or I			
	2017-2018		2016-2017		2017-2018		2016-2017		2017-2018		2016-2017	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
MATH 011	10-63%	4-100%	24-92%	4-100%	0	0	0	0	6-38%	0	2-8%	0
MATH 012	6-40%	8-80%	17-77%	4-100%	0	0	0	0	9-60%	2-20%	5-23%	0
MATH 021	28-100%	7-100%	37-100%	12-100%	0	0	0	0	0	0	0	0
MATH 022	22-85%	11-79%	25-93%	11-85%	0	0	0	0	4-15%	3-21%	2-7%	2-15%
MATH 101	30-91%	25-100%	37-97%	33-94%	1-3%	0	0	1-3%	2-6%	0	1-3%	1-3%
MATH 102	33-89%	24-100%	25-81%	29-81%	1-3%	0	0	0	3-8%	0	6-19%	7-19%
MATH 103	23-100%	28-100%	23-72%	22-69%	0	0	0	0	0	1-3%	9-28%	10-31%
MATH 107	26-100%	21-95%	9-100%	11-100%	0	0	0	0	0	1-5%	0	0
MATH 110												
MATH 121	28-64%	24-62%	23-68%	23-66%	15-34%	14-36%	10-29%	12-34%	1-2%	1-3%	1-3%	0
MATH 123	6-67%	8-67%	10-77%	9-75%	3-33%	4-33%	3-23%	3-25%	0	0	0	0
MATH 150	9-75%	13-57%	14-70%	11-58%	3-25%	10-43%	3-15%	6-32%	0	0	3-15%	2-11%
MATH 153	5-50%				5-50%				0			
MATH 162	10-100%	5-100%	10-91%	10-83%	0	0	0	2-17%	0	0	1-9%	0
MATH 163	5-83%	11-92%	4-100%	10-100%	1-17%	1-8%	0	0	0	0	0	0
MATH 180	25-93%	15-79%	19-79%	27-93%	2-7%	4-21%	4-17%	2-7%	0	0	1-4%	0
MATH 181			5-63%	10-77%			3-38%	3-23%			0	0
MATH 192			5-100%	5-83%			0	0			0	1-17%
MATH 264	8-100%	3-75%	10-83%	5-100%	0	1-25%	0	0	0	0	2-17%	0
STAT 145	19-50%	36-71%	33-72%	36-59%	19-50%	15-29%	3-7%	23-38%	0	0	10-22%	2-3%

Please describe any observed trends in the enrollment and retention of students in the program. Include your comments about the percentages of Dual Credit students (non-paying) in your observations.

Enrollment in developmental courses remains larger than the college-level courses. Students enrolled in developmental classes are making progress towards reaching the college-level courses. We observe that enrollment in business calculus remains strong.

Advisement and Support

Provide a description of program advisement for students.

Academic advisors can provide guidance through the admission process, degree and course selection, and registration. Advisors also assist with changing a major, following up instructors' early alerts, filing graduation petitions, and planning for baccalaureate work. Advisors can help resolve registration errors, as well. Degree-seeking students must meet with an advisor before registering for each semester to check that their chosen classes will continue to make progress toward their degrees and have their advising hold lifted.
The Division Chair also meets with students for advisement.

Describe any student support services that are provided by the program.

The Academic Support Center (ASC) offers a range of services to supplement UNM-LA's academic programs. ASC organizes and hosts homework/study groups, review sessions, and workshops, while offering additional course resources and various types of extra help and academic support (drop-in, by appointment, and online). Services cover a wide range of academic including Mathematics and the ASC math coordinator holds regular hours. Faculty are also involved in ASC activities and some hold office hours as the ASC.

Describe any student success and retention initiatives in which the program participates.

Department faculty and Division Chair participate in New Student Orientation, College Days, Study Nights at the library, ASC Open House events, etc.

VI. Faculty

Please answer these questions about your department.

Number of Continuing Faculty:	**2**	**Number of Part Time Faculty:**	**10**

Do the programs in the department have a "champion?" This could be a department/program chair or a volunteer. YES ☒ NO ☐

If Yes, please enter name(s) for each program.

Division Chair, Irina Alvestad

Please list all existing support positions: (Example: Lab Tech)

none

Is the number of personnel adequate to support your department and program areas?

☐ YES ☒ NO

If "NO", explain below.

Due to a recent job re-assignment, a resignation, and a retirement, the program needs to hire the equivalent of 1.0 FTE continuing faculty to maintain similar teaching loads and program delivery expectations. The program is relying heavily on adjunct faculty and there is often no teaching continuity that can be maintained.

Provide information about professional development activities of faculty within the department, particularly continuing faculty.

There have been minimal professional development activities and the ones that were offered were mostly in house.

Does the evidence exist to show that faculty members teaching in this department have involved themselves with our in-service training (Faculty orientation and/or Faculty Assembly events) and other professional development?

☒ YES ☐ NO

If "NO," please explain:

Provide information about any research/creative work activities of faculty within the department, particularly continuing faculty.

The Division Chair has served on the Faculty Professional Development Committee for many years, both as a member and as Chair. As part of a multi-year grant collaboration, she has also attended bi-annual workshops on teaching/learning topics. Faculty in the program attend Faculty Orientation activities twice a year and many Faculty Assembly presentations. Two faculty wrote an NSF grant proposal to develop and implement projects in mathematics courses; the proposal was not funded.

Please complete the faculty information in the following table, including faculty credentials and courses each faculty has taught.

Faculty Roster Form
Qualifications of Full-Time and Part-Time Faculty

Name of Department: Mathematics, Engineering, and Science
Academic Term(s) Included: Fall 2016, Spring 2017, Fall 2017, Spring 2018
Date Form Completed: July 19, 2018

Complete the following table with faculty names (both core and TPT) and highest degree for each. Are Academic credentialing forms and transcripts and/or copies of relevant certifications on file?

Faculty Name	C, TPT D, UN, UT List all that apply	Courses Taught for the last 3 academic years (Include term & course number) List all that apply	Academic degrees & graduate coursework (if needed to qualify to teach); Include certifications, work experience if needed to qualify to teach a course	Completed Academic Credentialing form	Transcripts on file	Copies of certifications on file IF APPLICABLE
Alvestad, Irina	C, UT	MATH 121/107; 264, 162/192, 123, 150, 153, 163	BS-Economics, Math; MS-Math; PhD-Math	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Beard, Mary Anne	TPT, UT	MSTH 162, 163	PhD-Math; MA-Math; BA-Math	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☐ No ☐ NA
Kaul, Ann	C, UT	MATH 123, 180, 181, 264, 162, 121/107, 163	BSEd-Secondary Ed-Math; MS-Applied Math; PhD-Applied Math	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No ☐ NA
Laeser, Melissa	TPT, UT	STAT 145;	BS-Math; MS-Mathematical & Computer Science	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Nava-Gaxiola, Citlalitl	TPT, D	MATH 011/012/021/022, 101/102/103	BSc-Physics, Math; PhD-Mathematical Sciences	☒ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No ☐ NA
Schmidt, Andrea	TPT, D, UT	MATH 121/107; 011/012/021/022; 101/102/103; STAT 145	BS-Applied Math & CS; MS-Applied Math	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No ☒ NA
Willerton, Kay	C/retired, D	MATH 101/102/103	BS-Math; MSE-Mathematics Education	☒ Yes ☐ No	☐ Yes ☒ No	☐ Yes ☐ No ☒ NA
Woods, Tadg	TPT, UT	STAT 145; MATH 150, 264, 121/107	BS-Math (English-Minor); MA-Applied Math; MS-Math; PhD-Math	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Gina Peterson	TPT, D	MATH 011/012/021/022	BS-Math	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Paul Lawrence Wilson, Jr	TPT, D	MATH 101/102/103	BS-Math	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Min Ro	TPT, UT	MATH 123; 150; 264	PhD-Math; MS-Math; BS-Math	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA
Morgan, Jiaming	TPT	MATH 101, 102, 103	BS-Physics/Microelectronics; MS-Physics; PhD-Physics	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No ☒ NA

C, TPT: Core, Temporary Part-time (adjunct); D, UN, UT: Developmental, Undergraduate Nontransferable, Undergraduate Transferable

VII. Resources and Planning

Part of the program review is to determine how much the program costs the institution.

Financial Information

Is the budget/expense information available to department and program chairs?

☒ YES ☐ NO

What was the total budget for the department including adjunct faculty (TPT) for the academic year?

	2017-2018	2016-2017
Amount budgeted for the year	**185,108**	**157,518**

Indicate departmental (program courses and/or departmental support courses) enrollment for the past 4 years for fall and spring.

Numbers	**2017-2018**		**2016-2017**	
	Fall	Spring	Fall	Spring
Course Enrollments (number of students)	**425**	**337**	**430**	**385**
Total Course Enrollments for Academic year	**762**		**815**	
Percentage of students who were dual credit			**8.83%**	
	2017-2018		**2016-2017**	
	Spring	Fall	Spring	Fall
Student Credit Hours for Department/Program	**734**	**905**	**848**	**931**
Total Student Credit hours for Academic year	**1639**		**1779**	
Percentage of students who were dual credit			**9.9%**	

Please give an approximate cost of the department per credit hour. (Amount expended ÷number of credit hours generated) for each academic year.

	2017-2018	2016-2017
Amount expended for the year	**152,935**	**135,476**
Cost per credit hour	**93.31**	**76.15**

***to date**

Comments: Please discuss the cost per credit hour and how this could be affected by the percentage of dual credit students in the courses.

Data for the number of dual credit students enrolled during 2017-2018 academic year was not available.

Library Resources

Describe the library resources that support the program's academic and research initiatives.

UNMLA Library provides the following services that support the program: borrowing books/materials, interlibrary loans, information literacy program, online databases, journals, magazines, etc.

Advisory Boards

Do any the programs under review have advisory boards?

☐ YES ☒ NO

If yes, how are the boards utilized for planning purposes?

External Funding

Has the department pursued any external sources of funding such as grants?

☒ YES ☐ NO

Please explain.

Two faculty in the program (Drs. Alvestad and Kaul) wrote and submitted an NSF grant proposal in fall 2017 to develop and implement projects in several math classes. The proposal was not funded.
Dr. Alvestad submitted a proposal to the Faculty Initiative Award program to develop materials for delivering the curriculum of the Precalculus and Trigonometry course (Math 153) in an online environment. The award was received and presented in Spring 2018.

Does the department have any plans to pursue external sources of funding?

☐ YES ☒ NO

Please explain.

Indicate the approximate amount of fee dollars generated for the last 3 years.

Fall semester Course Number	2017	2016
MATH 011	240.00	780.00
MATH 012	225.00	0
MATH 021	420.00	1140.00
MATH 022	390.00	0
MATH 101	330.00	1290.00
MATH 102	370.00	0
MATH 103	230.00	0
MATH 107	0	0
MATH 120	0	0
MATH 121	600.00	0
MATH 123	0	0
MATH 150	0	400.00
MATH 153	550.00	0
MATH 162	0	0
MATH 163	0	0
MATH 180	1350.00	1200.00

MATH 181	**0**	**400.00**
MATH 192	**0**	**0**
MATH 264	**0**	**0**
STAT 145	**1900.00**	**2300.00**
Spring Semester Course Number	**2018**	**2017**
MATH 011	**60.00**	**75.00**
MATH 012	**150.00**	**75.00**
MATH 021	**105.00**	**210.00**
MATH 022	**210.00**	**300.00**
MATH 101	**250.00**	**390.00**
MATH 102	**240.00**	**440.00**
MATH 103	**290.00**	**360.00**
MATH 107	**220.00**	**0**
MATH 120	**0**	**0**
MATH 121	**600.00**	**0**
MATH 123	**0**	**0**
MATH 150	**600.00**	**600.00**
MATH 153	**0**	**0**
MATH 162	**0**	**0**
MATH 163	**0**	**0**
MATH 180	**950.00**	**1450.00**
MATH 181	**0**	**650.00**
MATH 192	**0**	**0**
MATH 264	**0**	**0**
STAT 145	**2000.00**	**3050.00**

Is adequate financial support available to meet the needs of this program?

☒ YES ☐ NO

If "NO", please explain.

VIII. Facilities

Facilities and Equipment

Briefly describe the facilities occupied by your Department/Academic program. (i.e. classrooms, offices, labs, etc.)

Faculty in the program occupy two offices: the Division Chair has a single office, the 0.5 FTE continuing faculty shares an office with another faculty.
Classes in the program are scheduled in several classrooms across campus.

Is the space adequate to support the mission of your program for day and evening classes, if applicable?

☒ YES ☐ NO

If no, please explain

Briefly describe current types equipment (does not need to be extremely detailed) used by your Department/Academic program and indicate.

The program uses mostly teaching-related equipment: smart board, laptop, graphics tablet for grading.

Is the equipment adequate to support the mission of your program for day and evening classes, if applicable?

☒ YES ☐ NO

If no, please explain

IX. Program Comparison and Articulation with UNM

When appropriate, describe how the program being reviewed aligns with program requirements at UNM.

The mathematics program contributes to the Preparation for Transfer portion of UNMLA's mission, as well as the Pathways for Careers. Transfer courses align with program requirements at UNM.

Provide information on the distinguishing characteristics of the program being reviewed and discuss the program in comparison with other programs such as number of faculty, students, etc.

The mathematics program prides itself in being a rigorous program. Students enrolled in our mathematics courses are prepared very well by exceptionally well-qualified faculty: 100% of continuing faculty hold Doctoral degrees, and 75% of TPTs hold Mater's degrees and higher. The program offers on average 36 classes in the fall (78 credit hours total) semester and 32 classes in the spring semester (68 credit hours total). The mathematics program is the largest program at UNMLA with the most number of courses offered each semester.

X. Summary and Future Direction

After completing the above review of your program, synthesize the data you have provided, focusing on both the program's strengths and weaknesses. **Answer the following questions:**

a. Is the program contributing to the mission/strategic plan?

The program is contributing to the mission & strategic plan by offering courses to support the Preparation for Transfer and Pathways for Careers portions.

b. Is the program contributing to the general education of students?

Eighty percent of college-level courses offered in the program are a part of the general education core curriculum. Although Trigonometry (Math 123) is a pre-requisite for several general education core courses, itself is not considered one. We teach math 123 every semester. Calculus III (Math 264) is also not considered a general education core course, but we teach it every semester as it is a required course for many transfer degree programs in science and engineering.

c. Describe the overall strengths of the program.

Faculty members in the program and their dedication are the strengths of the program. They care that students get a quality education.

d. Describe the overall weaknesses (opportunities for improvement) of the program.

Faculty retention is the primary weakness of the program.

e. Within existing resources, how can the program be improved, more students recruited, and obtain certification (if applicable)?

Faculty retention can be improved by filling vacant positions for continuing faculty.

f. Describe actions to be taken as a result of this review, including instructional resources and practices, and curricular changes to be made.

Provide professional development opportunities for faculty.

g. What is your vision for the future of this program?

The vision for the program is to have less reliance on TPT faculty and to hire/identify a Developmental Math Coordinator. The program will continue to serve transfer students as well as support the mission of UNMLA.